

Title (en)

QUASI-ACHROMATIC OPTICAL ISOLATORS AND CIRCULATORS USING PRISMS WITH TOTAL INTERNAL FRESNEL REFLECTION

Publication

EP 0391703 A3 19910821 (EN)

Application

EP 90303641 A 19900404

Priority

US 33514689 A 19890407

Abstract (en)

[origin: EP0391703A2] A quasi-achromatic configuration of two nonreciprocal optical rotators (25, 27) coupled by linear retardation elements (26, 28) based on total internal Fresnel reflection, such that wavelength or temperature effects on the optical rotator elements compensate one another to give quasi-achromatic isolation and/or temperature stability when this optical configuration is incorporated into an optical isolator or circulator. A quasi-achromatic optical isolator through which a light beam within a wavelength range about a nominal wavelength may propagate is made from a sequence of elements having a first plane polarizer (24) accepting said light beam as an input, said light beam then passing through in sequence, a first Faraday rotator (25), a first wave-length independent linear retardation element (26), a second Faraday rotator (27), a second wavelength independent linear retardation element (28), and said light beam exiting said isolator undiminished in intensity through a second plane polarizer (29). A quasi-achromatic optical circulator having first, second, third and fourth ports is provided such that said circulator may accept a light beam within a wavelength range about a nominal wavelength and direct it to a succeeding port. A light beam enters said circulator through a first polarizing beam splitter (44) adjacent to said first and third ports and passes through sequentially a first Faraday rotator (25), a first wavelength independent linear retardation element (26), a second Faraday rotator (27), a second wavelength independent linear retardation element (28) and a second polarizing beam splitter (49) adjacent to said second and fourth ports of said circulator, whereby said light beam is transmitted undiminished in intensity to the next succeeding port.

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CPC (source: EP US)

G02F 1/093 (2013.01 - EP US); **G02F 2203/04** (2013.01 - EP US)

Citation (search report)

- [A] EP 0015129 A1 19800903 - FUJITSU LTD [JP]
- [A] PATENT ABSTRACTS OF JAPAN, vol. 9, no. 291 (E-359)[2014], 19th November 1985; & JP-A-60 130 934 (FUJITSU) 12-07-1985
- [A] OPTICS LETTERS, vol. 12, no. 7, July 1987, pages 462-464, New York, NY, US; K. SHIRAIISHI et al.: "Cascaded optical isolator configuration having high-isolation characteristics over a wide temperature and wavelength range"
- [XP] OPTICS LETTERS, vol. 14, no. 21, 1st November 1989, pages 1180-1182, Optical Society of America, Washington, DC, US; C.F. BUHRER: "Wideband temperature-compensated optical isolator or circulator configuration using two Faraday elements"

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